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RESEARCH ARTICLE

The importance of the continuity of practice: Ethnobotany of Kihnu island (Estonia) from 1937 to 2021

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Societal Impact Statement

Local knowledge is highly endangered in the modern world, and therefore, it is important to understand the factors contributing to the preservation of biocultural diversity. Three major aspects were identified: continuity of the practice, support for the ritual related to the use, and external acknowledgment of the local use by an authoritative source. Moreover, strong centralization of current local knowledge in institutionalized domains (ethnomedicine) was identified, which has excluded unacknowledged or officially unapproved local knowledge from circulation. The inclusion of local ecological knowledge as a practice in school curricula and the highlighting of local historical uses in herbals and popularizing activities are recommended.

Summary

- Plant use in local communities changes over time along with changing social, political, economic, and environmental conditions. The study aimed to understand the factors influencing the continuity of certain interactions between plants and people.
- To understand the drivers of resilience of the use of local flora, the historical (1930s) and current (2021) uses of plants on the small island of Kihnu in Estonia were compared, and the resilient uses were identified.
- Use resilience depended on the use domain. While the ethnoveterinary domain completely disappeared, the most resilient uses were those related to ritual (religious) activities, with 75% being retained (6 of 8 taxa used historically). This was followed by the wild food plant domain, in which 66% of taxa (21 of 32) have been retained, along with the highest proportion of taxa-use combinations (57%, 21 of 37). Historically the largest domain, ethnomedicine showed low resilience: 18 of 73 taxa have been retained, with only eight emic (or local) plant uses (PU). Moreover, we observed that 75% of the retained emic PU (6 out of 8) were supported by a centralized medical system, while this proportion was 87% for current uses and only 15% for interrupted uses that were promoted or acknowledged in centralized herbals.
- As the most important aspects influencing the resilience of plant use are the continuity of practice, ritualization, and external support for usage, the inclusion of local

ecological knowledge as a practice in school curricula and the highlighting of local historical uses in herbals and popularizing activities are strongly recommended.

KEYWORDS
biocultural diversity, centralization, Estonia, interruption of the knowledge, Kihnu, knowledge circulation, knowledge resilience, local ecological knowledge

1 | INTRODUCTION

A diversity of plants is an essential prerequisite for human life. Even more so is a diversity of knowledge regarding their use (Anderson, 2011). This knowledge, adapted to a particular place, has developed over countless generations but is currently being lost over the course of a few decades (Nighswander et al., 2021).

It is considered that modern European (especially medical) ethnobotany is mainly based on ancient herbals and later popularizing books (Leonti, 2011). Yet among the historical data, there are some cases considerably less affected by written knowledge that have a clear connection with the local flora and local understanding of diseases (Kalle et al., 2022; Kalle & Sõukand, 2021; Prakofjewa et al., 2022; Sõukand & Kalle, 2022).

If we compare the currently gathered ethnobotanical data with that available in historical sources, we can identify both changes in plant use and historically used taxa that continue to circulate. A similar trend was noticed by Dal Cero et al. (2023) for the medicinal plant knowledge circulating in written sources during the last 2000 years. They attributed this to the actual efficacy of some taxa, as proven by scientific studies. However, local ecological knowledge (LEK) is a complex of practices and beliefs and is not based only on efficacy itself (Turner et al., 2000).

The classical ethnobotanical approach examines the reasons for changes in plant use. Numerous factors have been identified, including changes in the environment (Fernández-Llamazares et al., 2015; Gómez-Baggethun et al., 2013), climate (García-del-Amo et al., 2023), lifestyle (Cuerrier et al., 2019), economy (Mattalia, Sõukand, et al., 2021; Reyes-García et al., 2007), policies (Ceuterick et al., 2008; Mattalia et al., 2023), education (Aziz et al., 2022; Nankaya et al., 2019), and so forth. Over time, long-term changes in the use of wild food plants have been studied in Europe, and a decrease in usage has also been noted (Łuczaj, 2010; Łuczaj & Dolina, 2015) including on the islands (Dolina et al., 2016). In other parts of the world, it has also been observed that the use of plants in medicine, especially on islands, is decreasing faster than the diversity of plants (Soelberg et al., 2015, 2016). Pieroni et al. (2013) pointed out in a historical comparative study of folk botanical knowledge in NW Macedonia that these knowledge systems are well remembered and partially practiced by elderlies but significantly eroded among the mid-aged and young population. A slowly growing body of research addresses the popularization of plants and the influx of new uses into LEK (Bexultanova et al., 2022; Prakofjewa et al., 2020).

There has been much less research aiming to understand the reasons for the "remainers," or plants that continue to circulate in local ethnobotany despite all the changes. The reason for this lack of study is that there are very few places in Europe where long-term historical comparison is possible. Usually, there is little information to be certain that the entire plant use system has been exhaustedly covered by the available historical sources, which either are fragmented or encompass only a single aspect (e.g., ethnomedicine or wild food) (Silva et al., 2014). The data are scarce, and the plants are hard to identify. Yet, for preserving place-based biocultural diversity, it is crucial to understand how to maintain the existing local knowledge in (health) sustaining ways.

Kihnu island in Estonia is unique, as a complete documentation of its ethnobotanical practices, including the identification of plants, was meticulously carried out in 1937–1939 by a local primary school teacher, Theodor Saar (1906–1984). Given the size of the island and its recent relative isolation, fieldwork was conducted in 2021 to obtain comparable results.

We aim to understand if and why some plant uses continue for generations and what the mechanisms are that support the retention of specific knowledge regarding the use of plants. We also want to understand the dependency of knowledge circulation on the domain of use.

To this end, we

1. digitized and analyzed the historical data collected by Theodor Saar,
2. conducted ethnobotanical fieldwork, and
3. identified the plant taxa and uses still in use after 70 years.

We will discuss possible reasons for the retention of specific taxa in certain use domains and propose a strategy for the preservation of local biocultural diversity.

2 | MATERIALS AND METHODS

2.1 | Kihnu island

Kihnu is a small island (area 16.4 km^2) in the Baltic Sea belonging to the Republic of Estonia (Figure 1). The registered population of Kihnu in 2023 was 631 people (kihnu.ee), but only about half of those consider themselves "kihnlane" (indigenous of Kihnu). In winter, many individuals live in the nearby mainland city of Pärnu. Kihnu cultural

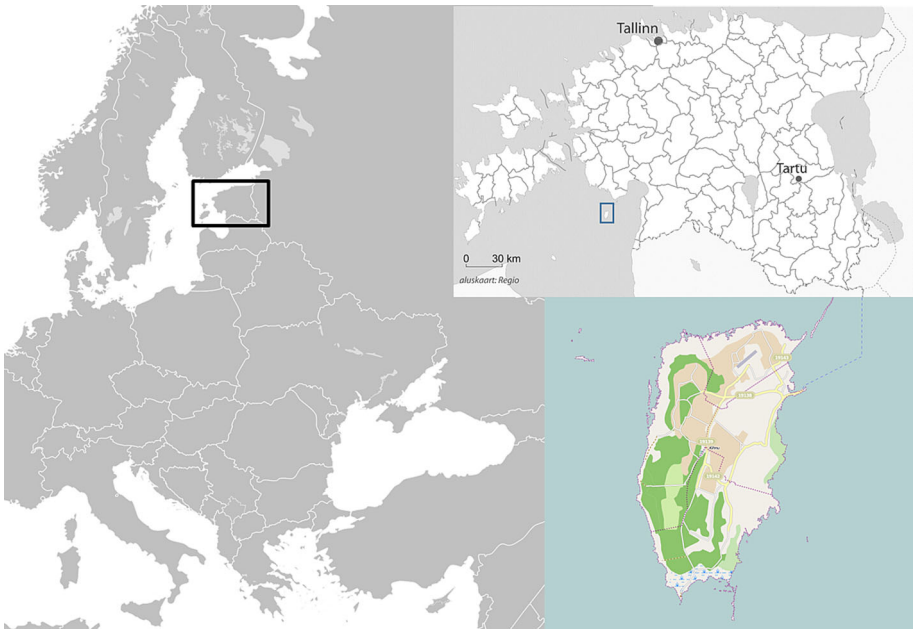


FIGURE 1 Research site: Kihnu island situated in the Gulf of Riga; source: https://commons.wikimedia.org/wiki/File:EE_Kihnu_Island_osm_map.png.

space is protected by UNESCO (Kihnu cultural space, 2023). The vegetation of Kihnu is characterized by semi-natural communities, pine forests, and wetlands with reeds. Fishing and cattle and sheep breeding have been practiced throughout history as there are no large fields. The island is surrounded by islets rich in bird species. The people of Kihnu have a deep relationship with nature, especially with the birds (Kalle et al., 2023).

2.2 | Historical data and its analysis

The sources of the historical data for analysis were the private correspondences of Kihnu primary school teacher Theodor Saar and Gustav Vilbaste (first Estonian ethnobotanist, 1885–1967), which have not been published previously. As a native of Kihnu, Saar was fluent in the local dialect, and he published several books about the nature and ethnography of Kihnu. From 1937 to 1942, Saar sent Vilbaste exhaustive data on the use of plants on Kihnu. Saar identified the local names of plants using official Estonian binary names, coinciding with the official "List of Estonian plants names" (Nenjukov, 1928). In the first letter to Vilbaste (1937), he provided the names and uses of trees, shrubs, berries, mushrooms, and lichens, while in the second letter (1938), he added a list of cultivated plants and their uses. In his third letter (1939), he amended the list of herbaceous plants and their uses.

As of today, the research conducted by Saar stands as the sole comparable historical study from the first half of the 20th century on the usage of wild food plants in a particular region of Estonia. Consequently, there is no basis on which to question the thoroughness of his research. The prevalence of various *en passant* snacks, which are still in use, is an important marker signaling the thoroughness of his records, although there might be some details missing, as often occurs with historical data.

The handwritten sources were transcribed and tabulated in Excel. Use categories were identified and served as a basis for the questionnaire utilized during the field study.

2.3 | Field study

Ethnobotanical fieldwork was conducted in June 2021. Twenty-three elderly and middle-aged local residents were selected using a convenient sampling method (encountering people on the street) and then interviewed. In-depth, semi-structured interviews lasted from 1 to 3 h.

In total, we interviewed 14 women and seven men who identified themselves as "kihnlane" and two women who were born on mainland, but have lived in Kihnu all their adult life. The oldest participant was born in 1934 and the youngest in 1998, with the mean age being 55 years. The sample included municipal employees, pensioners, tourism workers, cultural workers, fishermen, cooks, craftsmen, sailors, and so forth. The sample also included individuals who were born on Kihnu and worked either on the mainland or abroad, as well as natives who live on the mainland during the winter and return to Kihnu in the summer to work (for the tourist season). External contacts had an impact on the use of plants, as we were told sometimes, but we did not distinguish between the plant knowledge acquired outside or inside of Kihnu for two reasons: (1) Such knowledge was already started to spread on the island and (2) local knowledge was enriched in the same way in the past.

2.4 | Data availability and herbarium specimen

Fieldwork materials are currently stored in the personal archives of the authors. After systematization, fully anonymized transcripts will

be deposited in the Kihnu Museum and the Estonian Literature Museum. Communication of T. Saar with Gustav Vilbaste is stored in the Vilbaste manuscript collection (TN, volumes 1 and 7) at Estonian Literature Museum.

Plants were identified on site, and wherever possible, herbarium specimens were collected. Plant samples are stored at the Herbarium of the Estonian University of Life Sciences (TAA) bearing herbarium numbers KIHNU001–025. If the specimen was not available, the plant was identified on the basis of its popular name and full description of the plant and habitat. Some taxa (like *Hypericum*, *Betula*, and *Mentha*) were identified only on the genus level, even if voucher specimens were present for specific species of the genus, to avoid over-identification. Saar specifies *Betula pendula*, as only one Betula species was growing on the island at that time. The identification of plants in the historical sources was carried out by Theodor Saar and later confirmed by Gustav Vilbaste. All the plant names follow POWO (2021).

3 | DATA ANALYSIS

All recorded emic (named by locals) use categories were grouped into 12 domains (Table S1) in order to simplify comparison. The uses, considering two major domains (food and medicine), were arranged into comparable categories, which for the food domain was based on preparation method. The *International Classification of Primary Care*, 2nd edition (ICPC-2, Updated March 2003), was used for generalizing medicinal (disease) categories. The historical data contained some emic diseases (such as evil eye or magical protection) that were not compatible with ICPC-2 classification, and for these, an additional category of culture-bound diseases was adopted.

The field data were structured into detailed use-reports (DUR) reflecting the use of a plant part (e.g., fruits, leaves, aerial parts, flowers, etc.) used in a certain way (e.g., cooked and fresh) for a certain use domain multiplied by the number of people mentioning such a use. We also calculated plant uses (PU—the use-report for a specific use regardless of the number of people mentioning such a particular use, e.g., taxa-use category combinations) for comparison.

Further, we compared PU and taxa recorded in the historical sources and those mentioned in the 2021 fieldwork. Jaccard similarity indices (JI) were calculated for used taxa and PU following the methodology of González-Tejero et al. (2008):

$$JI = (C/(A + B - C)) \times 100,$$

where A represents the number of taxa/PU in sample A, B is the number of taxa/PU in sample B, and C is the number of taxa/PU common to A and B.

We divided the obtained data into three different stages of knowledge circulation:

1. 1930s—the data reported by Theodor Saar,
2. ~1990s—the uses reported by our interviewees as once utilized, but now abandoned (the date largely corresponds to the decade of the fall of the Soviet Union as the majority of uses were abandoned at that time according to our interviewees), and
3. 2020s—the uses reported as currently in use during our fieldwork in 2021.

To examine how centralization affects the medicinal use of plants on the studied island, we analyzed our findings by comparing them to the recommendations outlined in Kook and Vilbaste (1962). This book was the only popular herbal published in several editions during the Soviet era in Estonian and was fully in agreement with the official medical system, thus reflecting the information disseminated by medical doctors and pharmacists.

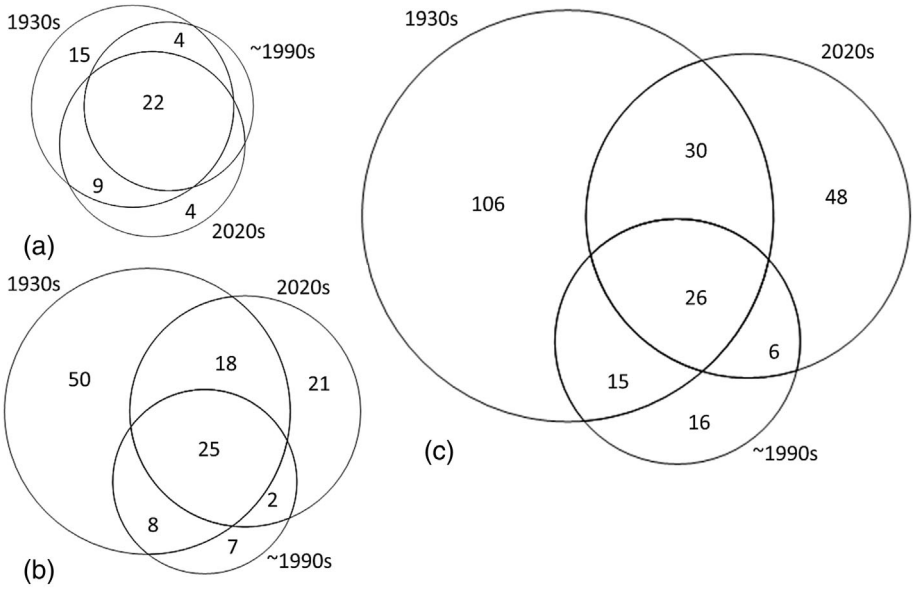
4 | RESULTS

One hundred thirty-one plant taxa belonging to 55 families were used on Kihnu: 101 taxa from 55 families were used historically, while 66 taxa from 35 families are currently in use; 43 taxa were used historically and are still currently used (Figure 2 and Dataset S1). Only seven taxa were used for short time (not mentioned in historical sources but remembered as used in the past by current interviewees): *Malus sylvestris*, *Nicotiana rustica*, *Vaccinium oxycoccos*, *Origanum vulgare*, *Poaceae* (*kõrred* "straws"), *Sinapis arvensis*, and *Isatis tinctoria*. On the use level, 247 PU of plant taxa were recorded, of which 177 originated from Saar's documentation, while 110 were recorded as currently used in 2021. Sixteen PU were recorded as temporary, for which three taxa were related to animal fodder (*Chenopodium album*, *Solanum tuberosum*, and *Angelica sylvestris*), while *Artemisia absinthium* had dual uses (food and medicine); the remaining three taxa belonged to different domains (*Secale cereale*, household; *Angelica sylvestris*, forecast; *Urtica dioica*, dyeing). The use domains showed proportional changes, most evident in food and medicine, where medicinal uses dominated past PU and food uses dominate current PU (Figure 3).

The majority of the 43 taxa that have remained in use over the time have been multifunctional (e.g., used in at least two different domains), the only exceptions being *Fragaria viridis*, *Ribes alpinum*, *Acer platanoides*, and *Brassica oleracea*.

The multifunctionality of plant taxa, however, was much higher for historical uses compared to current uses (Figure 3c). Three taxa (*Betula pendula*, *Tilia cordata*, and *Syringa vulgaris*) have retained the multifunctionality level of their historical use. Among the top 10 currently used multifunctional taxa (used in three or more domains), only *Primula veris* was used in a single domain in the past. *Arctium tomentosum*, which was historically used in four different domains (medicine, food, cosmetics, and household), has disappeared from the memory of our interviewees, while the use of three historically multifunctional taxa (*Angelica sylvestris*, *Frangula alnus*, and *Solanum tuberosum*) are now known solely as past uses.

Among the local community, still used wild food plants accounted for 66% of taxa mentioned in the historical data (21 out of 32 taxa). A slightly lower (57%) proportion of PU is still in use (21 out of the 37 PU used in the 1930s). The highest percentage exhibited, however,



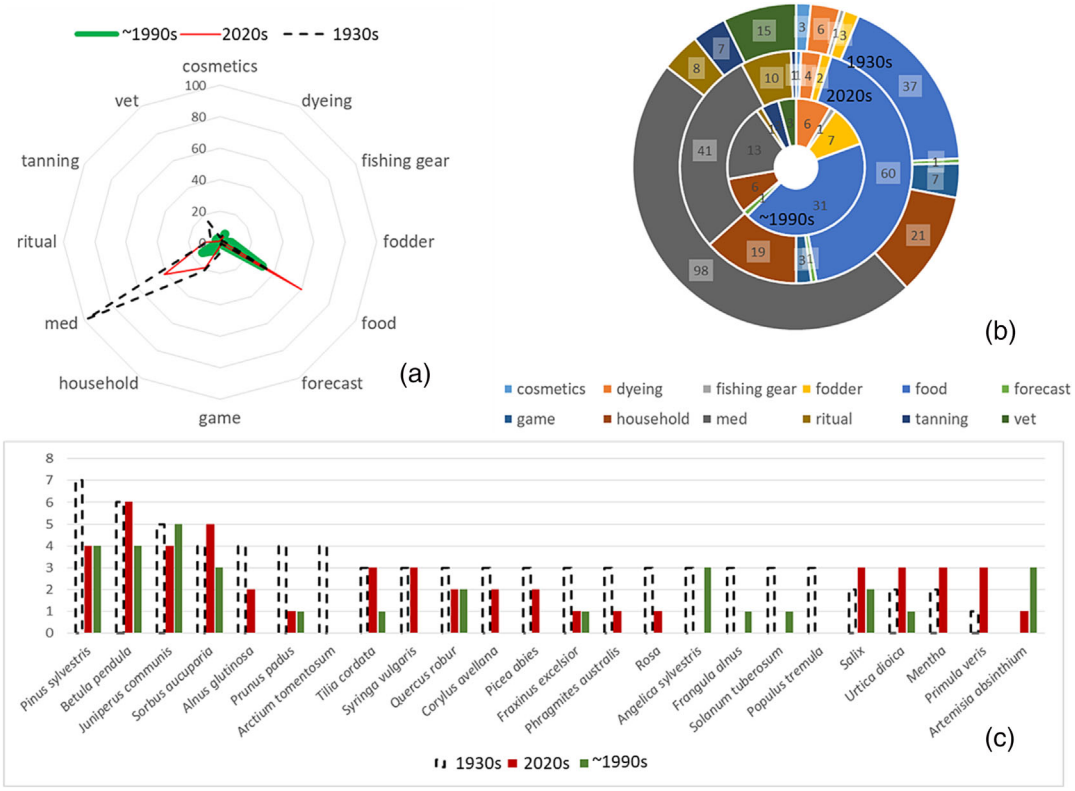


FIGURE 3 The dynamics of changes to how plants have been used on the island of Kihnu since the 1930s. The number of plant uses in Kihnu is analyzed for each of the different circulation periods (three time categories 1930s, 1990s and 2020s). Dominating domains (a), division of uses by use domains (b), and the number of domains for which the most multifunctional plants were used in different time periods (c). Two dominating use domains are medicinal and food uses, followed by household-related uses. While the medicine was most popular domain in 1930s, food have become the most popular domain in 2020s. There is a clear change in multifunctionality of the most diversely used plants through the time.

was for ritual uses at 75% (6 taxa currently in use out of 8 used historically). Notably, all the taxa continuously used for rituals are trees (*Salix*, *Betula*, *Sobrus*, *Juniperus*, *Pinus*, and *Syringa*). The initial division into specific uses yields a proportion of only 37% (3 uses out of 8 retained; e.g., *Pinus sylvestris* as Christmas trees, *Salix* as decorations for Palm Sunday, and the five-petal flowers of *Syringa vulgaris* eaten for luck). Yet, changes in the use of *Betula* (decoration of the home vs. decoration of a ship for the same holiday) and *Sorbus aucuparia*

(used to contain bad spirits in a specific ritual in the 1930s and for protection of animals against the evil eye in the 2020s) represent quite similar applications. Moreover, the use of the smoke from burning *Juniperus communis* for protection can be considered a simplified derivation of the same application as a panacea against many diseases (categorized under general medicinal use).

The household domain is also relatively sustainable, as currently, 43% of historically used taxa is employed (9 out of 21) and 10 new taxa were mentioned. In the dyeing category, there are 2 historically used taxa out of 6 (33%) still in use today, as well as two new taxa recorded; however, the domain has recently been heavily promoted as part of the cultural heritage of the island. The proportion of the historically used medicinal taxa still in use is less than 25% (18 out of 73).

Leather tanning, a practice largely restricted to the past, showed continuity for only one taxon (*Salix*), while the use of six taxa remained in the past (16%). There are no overlaps in the domains of fodder, forecast, cosmetics, and children's games, although in all four domains, the number of taxa used was already very small. Two domains had only historical or past uses: (a) the use of *Pinus sylvestris* (the only taxon) for making fishing gear, and (b) in the ethnoveterinary domain, 15 taxa were used historically while the past use of three taxa was remembered by our interviewees.

Eight taxa (*Matricaria discoidea*, *Mentha*, *Thymus serpyllum*, *Juniperus communis*, *Betula pendula*, *Ribes nigrum*, *Tilia cordata*, and *Rubus caesius*) were used in both the food and medicinal domains, both historically and currently, and can be considered culturally salient food-medicine taxa.

The wild food domain was the only domain that increased significantly, with 15 new taxa currently used (Figure 4) and 35 new and often innovative use-taxa combinations (Figure 5a). Medicinal domain had lost also many historical uses for the taxa still in use (Figure 5b).

Of 86 medicinally used taxa, 12 were cultivated (14%), whereas the rest were wild. Of the 53 medicinal taxa used only historically, six (11%) were cultivated, while among the 11 solely currently used medicinal taxa, two (21%) were cultivated.

Only eight specific emic use-taxa combinations can be identified as continuously used (Figure 6 and Dataset S2), of which six (75%) were supported by a centralized medical system, while this proportion was 87% for current uses (2020s). Only 10% of interrupted uses (uses that were recorded in the 1930s but were not mentioned as currently used in 2021) were promoted, while another 5% were acknowledged as belonging to the folk medicine domain in centralized herbals.

5 | DISCUSSION

We observed a rapid decrease in plant-related knowledge on Kihnu, which is also a general trend in Europe, especially in the ethnomedicinal domain (Lumpert & Kreft, 2017; Petelka et al., 2020; Pranskuniene et al., 2018; Sõukand & Kalle, 2011). This is affected by, among other things, new effective medicines, better healthcare, changes in epidemiology, and improvements in sanitary conditions. Although there are numerous factors that contribute to the resilience of local biocultural diversity and local ecological knowledge, three key aspects can be emphasized:

1. continuity of practice of plant use (e.g., the existence of specific environmental, social, political, and other conditions supporting the continuity of practice),
2. ritualization of plant use (which may help to reinforce the importance and value of plants and maintain strong awareness of the practice), and

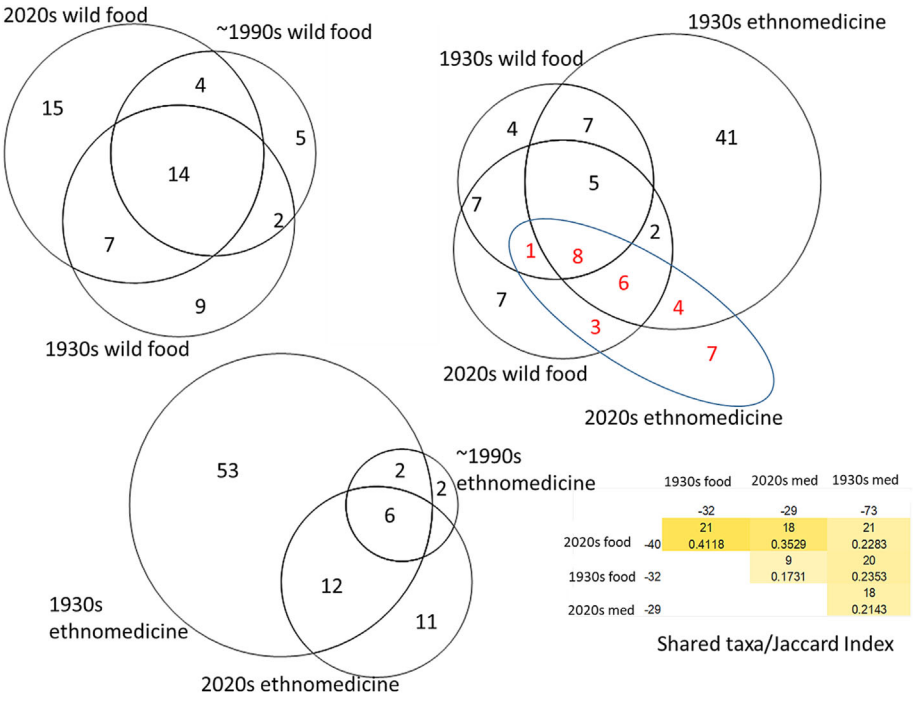


FIGURE 4 A comparison between the number of taxa used in Kihnu in different time periods in the wild food and ethnomedicinal domains, demonstrating greater retention of the used taxa in wild food domain compared with the ethnomedicinal domain. Also, there are proportionally more taxa acquired in wild food domain compared to those lost over time. More than half of the taxa currently used in ethnomedicine are also used in the wild food domain.

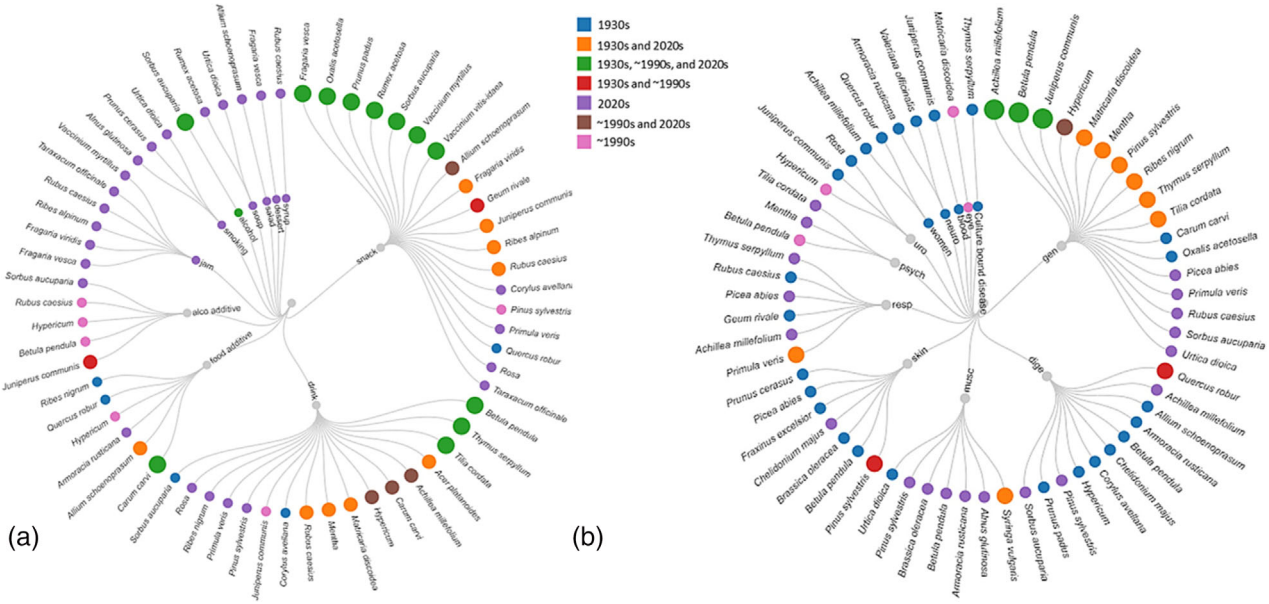


FIGURE 5 Use categories and knowledge circulation of taxa present in all three time periods for the wild food (a) and ethnomedicinal (b) domains in Kihnu. In wild food domain, there are many innovative uses for the taxa known and used in the past, while in medicinal domain, majority of the uses remained in the past. In the food domain, 21 uses continued through the century, while in the medicinal domain, there are only 11 continuous uses in same etic category.

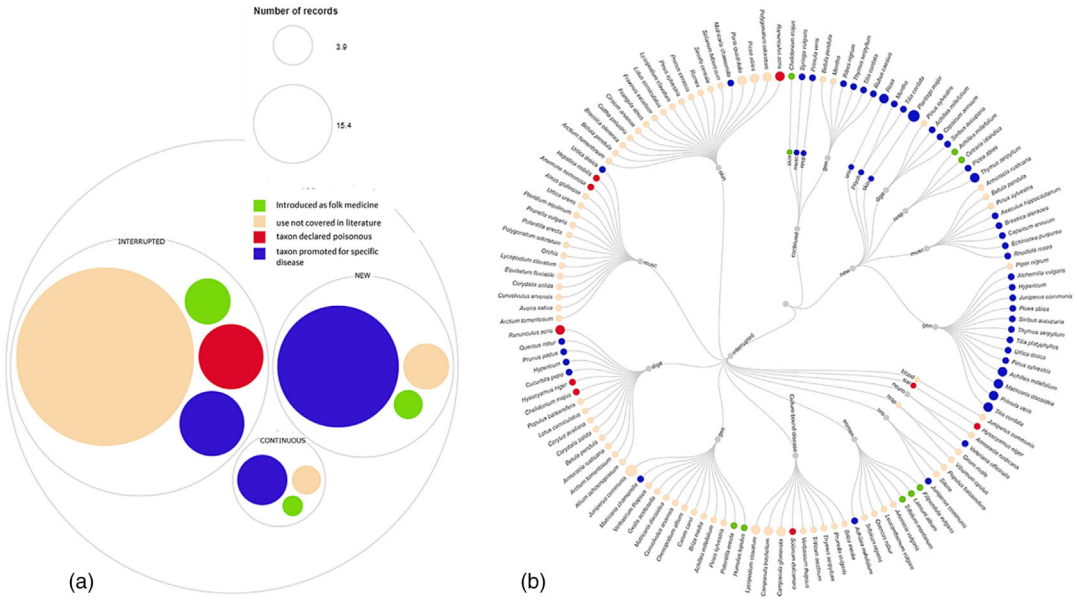


FIGURE 6 Illustrates the influence of the popular medicinal literature on the use of medicinal plants in Kihnu. (a) Reflects the general proportion between plant uses promoted in centralized herbals and those that were not promoted and (b) shows the contribution of every taxa-use combination for all medicinally used plants in the 1930s and 2020s. Dominant part of discontinued taxa-use combinations were not covered in the literature, while major part of new and continued uses were popularized by the centralized medicinal system.

3. support from outside sources (popular literature, workshops, TV, and other media), which potentially highlight local plant use.

It is important to emphasize that maintaining the continuity of practice is essential for preserving knowledge. Knowledge can only be preserved and developed under conditions in which there is continued activity. Entire domains of traditional knowledge, such as ethnoveterinary medicine, fodder management, and leather tanning, have already been forgotten or are only partially remembered due to the lack of continued practice. Obviously, the ethnoveterinary use of plants has disappeared over the last 80 years with the emergence of centrally regulated veterinary services (see Kalle & Kass, 2020; Kass

et al., 2022; Mattalia, Belichenko, et al., 2021). In such a context, there is no longer any space for the valorization of specific LEK. Even if private animal husbandry is restored on the island, there are no knowledge holders able to teach the forgotten uses.

The household domain also speaks in favor of the continuing of practice as this domain has retained a relatively high percentage of past uses, given that plants are used *en passant* during everyday activities and were sometimes also ritualized.

The ritualization of use is indeed an important aspect of LEK preservation and needs to be acknowledged as such. Paradoxically, ritualization not only preserved a large portion of the previously used taxa but also introduced the use of four new plant taxa. Here, it could have played a role in the revitalization of religion after the fall of the Soviet Union. Similar results were found in Ukraine, where the religion-related ritual use of taxa became much more numerous after the fall of the Soviet Union (Stryamets et al., 2021). However, we approach ritualization from a much wider perspective, referring to actions that are regularly performed to follow established collective norms rather than religious beliefs. The resilience and even robust reinforcement of ritualized uses, even if slightly changed, reveal the socially potent meanings of magic utilization and, ultimately, of the invisible and intimate nature of plant–human relationships. The ritual-related use of plants is not predominantly linked to the perceived intrinsic properties of the plant (such as in food, medicine/veterinary, handicrafts, dyeing, or fiber domains) but goes beyond these. The persistence of such an immaterial (magic, intangible) value gives hope for local resilience in the postmodern world, where nature is becoming more and more detached from real life. The ritualized use of plants strengthens, on a regular basis, *tacit knowledge* (framed by Hungarian philosopher Michael Polanyi, Polanyi & Sen, 2009, as a kind of pre-linguistic knowledge acquirable only through participation or living through the process) and its impact on our relationship with nature (Maran, 2020).

In such a practice as wool dyeing, which is now more of a fancy hobby that has been considered and promoted, according to our interviewees, as representative of Kihnu cultural heritage, only two taxa overlapped with historical uses, as yarn is now dyed only in specific workshops. Here, the external input (acceptance as cultural heritage on the international level [UNESCO]) has had an important influence on not only the preservation but also the revitalization of practice, with two new taxa introduced recently and in the recent past. However, those introduced taxa (*Isatis tinctoria* and *Urtica dioica*) will not be retained for long if they are no longer supported.

The medicinal domain is a more complex example of the impact of widespread promotion in the literature and media. The use of medicinal plants changed because of the strong influx of (and increasing dependence on) official medicine, which in one way or another (through doctors or popular herbals, as well as modern media) popularized officinal (centrally approved) medicinal plants. Therefore, the taxa abandoned were mainly local species not supported by official medicine. However, in general, the medical system in the Soviet Union maintained the tradition of utilizing wild plants for medicinal purposes, as medicinal plants were suggested by doctors, sold in pharmacies, and promoted by an herbal in Estonian published in many runs, totaling about a hundred thousand copies, over three decades. The two taxa that were used only for shorter time were also part of the official medicine. A large portion of the current use-plant combinations have been promoted by external, mainly centralized, Soviet sources (primarily Kook & Vilbaste, 1962).

Why are wild food plants more resilient? At least on Kihnu, we can observe that over the past century food industrialization and books have not destroyed the minor safeguards of foraging and domestic cooking. We can address this in the context of changes in plant gathering and cooking in Europe during the past century—in contrast to medicinal plant use—as a result of at least three factors:

1. experiencing and "eating memories": locals in rural areas sometimes forage (even if only occasionally) to keep alive family food memories (Ghosh, 2022);
2. food identities (Zepelin, 2022): sometimes locals retain a certain wild food plant because "it's their history"—this is an important aspect in isolated communities and minority groups on Kihnu; and
3. leisure: the recreational character of foraging as well as that of "playing" within nature and in cooking "past recipes" has also been highlighted in another ethnobiological study specifically focused on the motivations linked to the resilience of foraging in SW Europe (Reyes-García et al., 2015).

The use of wild food plants on Kihnu includes a combination of all three aspects (the continuity of practical activities, promotion, and some elements of ritualization). This is an important domain characterized by the continuous use of more than 50% of the recorded taxa-use combinations and the extensive revitalization of use (with the number of the new taxa-use combinations more than twice that of abandoned use-taxa combinations). On the island, wild food is an integral part of the daily diet despite relatively good access to the mainland. This is because the island's isolation is still felt, and local ecological resources continue to be consumed. The ritual part of the equation also contains preservation activities, which are routinely continued from year to year, as well as ritual food use during specific holidays. At the same time, specific wild food uses have recently been promoted by Estonian TV and (social) media.

We recommend the following steps in order to increase the resilience of local biocultural diversity and local ecological knowledge in modern (and often highly literate) communities:

1. inclusion of local ecological knowledge in school curricula, in which practical activities need to start as early as elementary school;
2. introduction of ritual elements into the local use of plants (e.g., specific seasonal festivities for wild food plant uses), shared herbal tea making evenings, communal collection events of shared ecological resources, and so forth; and
3. highlighting local historical uses in herbals, cookbooks, and various popularizing activities, stressing the importance of keeping alive local ecological practices and the transfer of knowledge to younger generations. However, the use of "raw" historical data is

not suggested, as it needs to be filtered by specialists able to contextualize this type of data (for more details, see Sõukand & Kalle, 2022).

The resilience of local ecological systems is important in preserving local identity and culture, and it also serves as a safety net for the community in the event of unexpected circumstances (see also Sõukand et al., 2021), regardless of the perceived level of isolation of the community.

AUTHOR CONTRIBUTIONS

Raivo Kalle, Renata Sõukand, and Andrea Pieroni conceived and designed the study; Raivo Kalle, Renata Sõukand, and Andrea Pieroni conducted the fieldwork; Renata Sõukand and Raivo Kalle conducted the data analysis; Renata Sõukand wrote the first draft. Renata Sõukand, Raivo Kalle, Julia Prakofjewa, Matteo Sartori, and Andrea Pieroni revised and edited the paper; all authors reviewed and approved the final version.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in the supporting information of this article.

ETHICS STATEMENT

The ethical guidance of the International Society of Ethnobiology (ISE, 2006) was rigorously followed. Oral informed consent was obtained, and the interviews were recorded upon agreement, solely for the purpose of transcription, after which deleted to grant total anonymity to interviewees.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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